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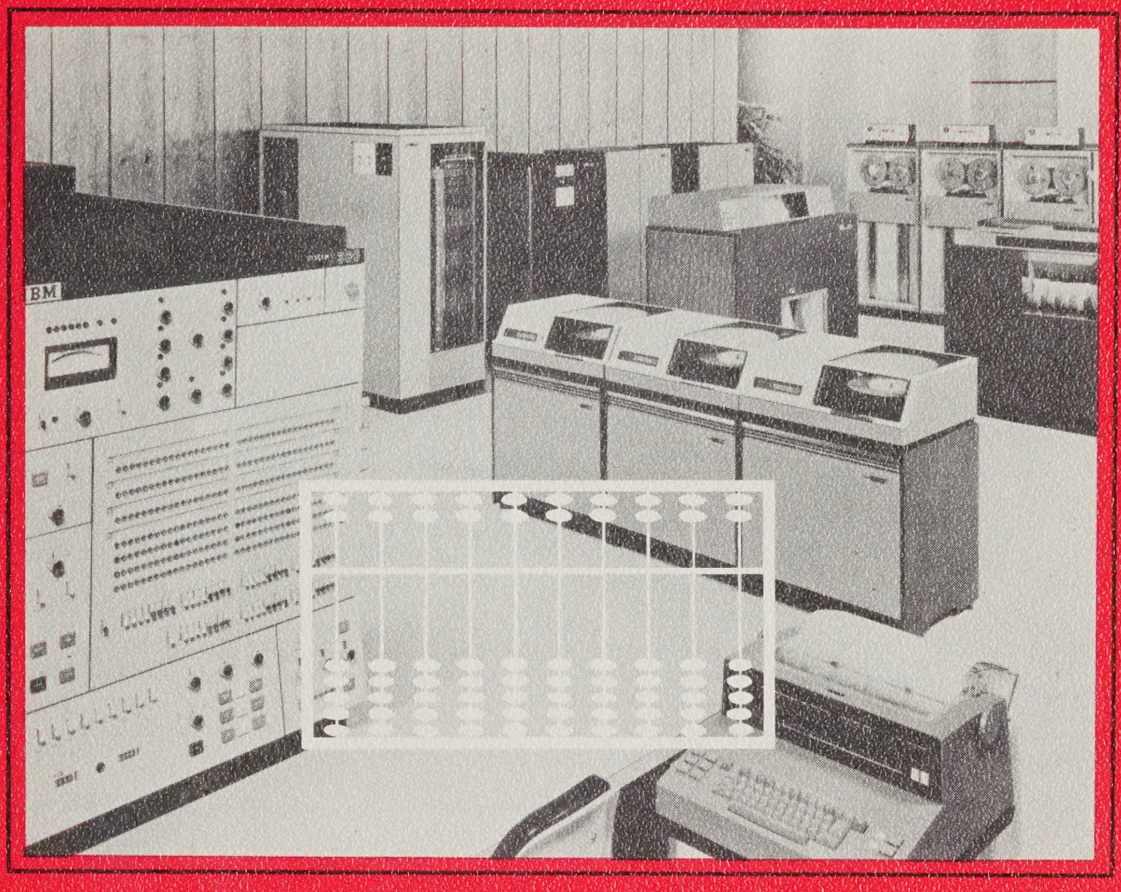

DATA PROCESSING

grade 10 – volume 1

EDUCATIONAL TELEVISION SERIES 1967-68

Educational Television Branch
ONTARIO DEPARTMENT OF EDUCATION
1670 Bayview Avenue/Toronto 17

program schedule

DATA PROCESSING
grade 10

10 programs 20 minutes each

PROGRAM NO.	CBC 9:50	CBOT 9:40
1	Oct. 20	Oct. 16
2	Oct. 27	Oct. 23
3	Nov. 17	Dec. 11
4	Dec. 8	Dec. 18
5	Jan. 12	Jan. 8
6	Feb. 2	Feb. 5
7	Feb. 23	Mar. 4
8	Mar. 8	Mar. 25
9	Mar. 29	Apr. 8
10	Apr. 26	Apr. 29

IMPORTANT *PLEASE NOTE!*

Principals of schools are asked to fill in the label below and indicate the quantity required for VOLUME TWO OF THIS GUIDE, by circling the figures 2 5 or 8.

One copy of volume two will be sent automatically without returning the label; this form is for more than one guide.

- DETACH PAGE ALONG PERFORATION
- TYPE YOUR NAME AND ADDRESS ON THE LABEL
- INDICATE QUANTITY BY CIRCLING 2 5 OR 8
- RETURN TO THE EDUCATIONAL TELEVISION BRANCH

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1670 BAYVIEW AVENUE, TORONTO 17, ONTARIO

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DATA PROCESSING, Volume 2 2 5 8

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DATA PROCESSING—Volume 1

A series of 10 programs of 20 minutes each for students in grade 10 with general interest for grades 11 and 12

This is volume 1 of a two-volume series

The last six programs will be contained in volume 2

contents

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Optimum viewing conditions		inside back cover

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Teachers guide prepared by:

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general introduction

This series of ETV programs is a presentation of the introductory course in Data Processing, and is designed to reinforce the classroom teaching of this new and fascinating subject. While planned primarily for the grade 10 level, following closely curriculum RP-33, the series should be of interest and benefit to any grade studying data processing for the first time.

Throughout the series, emphasis has been placed on:

a. Man's need to process data (information).
b. The development of newer and faster methods as the need arises.
c. The evolution of modern data processing systems based upon the contributions of the past.

The information given in the series is intended to present those parts of the course which lend themselves to visual presentation and which would be difficult for the teacher to present without searching through vast sources of reference and visual material.

It is felt that the series will add an additional dimension to the students' understanding of data processing by presenting television visits to actual business establishments.

Many of today's great achievements, such as the space programs, would not have been possible without the assistance of modern, high-speed data processing systems. The television series will show the subject as an important preparation for future life.

program one

THE INFORMATION EXPLOSION

The purpose of this program is to provide a study of the background and historical development of data processing methods and devices. Its secondary purpose is to develop an appreciation of the need for, and the ingenuity of, modern data processing equipment.

PROGRAM CONTENT

This first program briefly traces the historical development of data processing aids from ancient times, through the dark ages and the Renaissance period, the Industrial Revolution, up to the present day with its high-speed electronic systems.

The program points out that data processing always involves some sort of input, some way of storing or remembering of information, a control, processing and output. With this in mind, it traces down through history some of the increasingly complicated ways in which man has "data processed" information. Commencing with finger-counting, the program refers to sand and pebble trays, the abacus, the Hindu and Arabic numbering systems and Stonehenge.

Gutenberg's invention of the printing press, together with the Renaissance opened a new phase in the life and growth of Western Europe. In the area of commerce and business, new needs arose which resulted in advances in methods of data processing. The program refers particularly to Blaise Pascal's invention of the numerical wheel calculator and to Charles Babbage's *Difference Engine* and *Analytical Engine*. The latter, known as "Babbage's Folly", failed because contemporary technology was unable to cope with it, nor did the need for such a machine yet exist. In developing his *Analytical Engine*, Babbage incorporated the principle of punched cards, invented by Jacquard for his looms. In turn, the *Harvard Mark 1*, put into service in 1944, is based on principles used by Babbage in his engine. Thus, most inventions and advances incorporate ideas previously worked out by some other person.

The program concludes with a reference to the tidal wave of information which is now engulfing the world and points out that any data processing machine developed can be no greater than the men who design the system and program the information.

POINTS OF EMPHASIS

1. Each new development has been in response to a need.
2. Each new development has been based upon the knowledge and contributions of the past.
3. Mounting volumes of paper work and repetitive tasks have brought about the need for mechanical aids, from the comparatively simple adding machine, to the complex, high-speed electronic equipment.

SUGGESTED PRE-VIEWING ACTIVITIES

If not already covered in class, students could present reports on the principles of the sand and pebble tray, the abacus, Stonehenge, and other "data processing" devices used by man in his earlier stages of development.

SUGGESTED POST-VIEWING ACTIVITIES

1. Students may be interested in conducting more detailed research into some of the inventions mentioned on the program—*Jacquard's Loom, Babbage's Engines, Pascal's Wheel Calculator, the Harvard Mark 1.*
2. Discuss the idea that each development in data processing has been in response to a need.

Bibliography

Mathematics, Chapter 1, *Life Science Library*, Time Inc., New York.

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program two

INPUT TO OUTPUT

This program introduces the five factors that are present in any data processing system—past or present, small or large—namely, INPUT, STORAGE, MANIPULATION, OUTPUT, and CONTROL. The program also illustrates the function symbols employed to represent them.

PROGRAM CONTENT

Even though the human brain is still the best machine we have, it is incapable of keeping pace with the information explosion which, by 1970, will result in the sum of human knowledge being increased every five years. However, as needs have altered, new developments have come along to help us cope with these. To illustrate this, the program refers to Charles Dickens' description of the office in *Dombey and Sons*, to William Seward Burroughs' development of the adding machine and to other inventions.

Regardless of volume or complexity, the flow of information involves the same five basic factors. The volume of data transactions (INPUT and STORAGE), and complexity of processing (MANIPULATION), information requirements (OUTPUT), and the overall accuracy of the system (CONTROL), are instrumental in determining the means by which data are processed.

The latter part of the program is devoted to a detailed study of the interrelationship of these factors when applied to a specific problem. Viewers will be taken into a business and shown its operations in terms of these factors.

POINTS OF EMPHASIS

1. The five factors outlined are applicable to any data processing system.
2. The OUTPUT requirements determine the INPUT, STORAGE, and MANIPULATION requirements.
3. The CONTROL factor is concerned with ensuring that all operations are performed, and that the operations are performed accurately and in the proper sequence.

SUGGESTED PRE-VIEWING ACTIVITIES

1. Introduce the five factors of any data processing system using examples that the students may suggest, or with which they are familiar.
2. Use appropriate symbols to represent the various factors, i.e. I.B.M., American Standards Association, etc.
3. The students should be familiar with the use of template to show chart problems by means of symbols.

SUGGESTED POST-VIEWING ACTIVITIES

1. Discuss the interrelationship of the five factors in terms of the example shown on the broadcast.
2. Construct a flow-chart—a series of simple problems using the appropriate INPUT, STORAGE, MANIPULATION, and OUTPUT symbols.
3. Point out the significance of the CONTROL factor with specific reference to the students' flow-chart.
4. Include additional processing steps which would be useful in proving the accuracy of the overall operation.

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program three

MANUAL DATA-PROCESSING

The purpose of this program is to demonstrate the processing of information by manual methods, including the use of simple machines and devices.

PROGRAM CONTENT

Manual data processing—a combination of manual methods and simple machines—is still wide-spread. The telecast indicates the variety of businesses which employ this type of processing, pointing out that the need dictates the best sort of system for the particular business.

The symbols for the five data processing functions are again shown, this time being used in making a block diagram or a flow-chart.

Most of the program is devoted to a survey of the system employed by a relatively small manufacturer of automotive chemicals and detergents. During this filmed visit to the company, the viewer sees the use of the time clock, the writing board, the payroll routine, purchase order sequence, inventory control, sales and billing routines, sales' analysis, edge- and field-punched cards, needle-sort procedure, Telex and spirit duplicator.

POINTS OF EMPHASIS

1. The five basic data processing functions are present in all information handling, regardless of the method employed.
2. Manual methods, which invariably include the use of some devices or aids, are still found adequate in some applications.

SUGGESTED PRE-VIEWING ACTIVITIES

Discuss or, if possible, demonstrate the use of the writing board, edge- and field-punched cards, needle sorting.

SUGGESTED POST-VIEWING ACTIVITIES

Discuss the data processing methods as seen at the Tumbler Laboratories. Does the general procedure followed seem to be the most economical method for the particular situation?

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program four

THE BUSINESS MACHINES

The purpose of this program is to demonstrate mechanical methods of data processing as employed in actual business situations.

PROGRAM CONTENT

The program opens with a brief survey of the great range of business machines now on the market, each designed to serve a specific purpose. It has, in fact, become difficult to draw a firm line between machines which are mechanical, electro-mechanical, or which are computers.

Most of the program presents a survey of the data processing operations in a large soft-drink plant where an accounting machine is used which actually acts like a computer. The survey shows the use of requisition and return sheets and magnetic cards in processing the day's sales, preparing a sales analysis and computing details of drivers' sales. It also presents details of payroll procedures at this plant.

POINTS OF EMPHASIS

1. The more sophisticated machines have been developed in response to a need.
2. Many business firms employ mechanical methods of data processing because these are found to be adequate for their particular purposes.

SUGGESTED PRE-VIEWING ACTIVITIES

1. Review the evolution of the business machine, from Pascal's "gears" to the modern desk calculator.
2. Discuss "magnetic cards", with the strip of magnetic tape (on the back) which is used to store information.

SUGGESTED POST-VIEWING ACTIVITIES

1. Discuss payroll procedures as seen at Wilson's Ginger Ale, noting that the plant workers are paid on an hourly basis, the drivers are paid a salary plus commission, and the office staff are paid on a weekly basis.
2. Note ways in which the accounting machine acted like a computer.

FOR OPTIMUM VIEWING CONDITIONS

1. Review Teacher's Guide well in advance of each telecast.

2. Have the set on and adjusted, sound off, prior to telecast.

3. Assure student comfort
   - — located for best viewing
   - — no glare, reflection on screen
   - — room properly ventilated
   - — suggested materials ready
   - — within maximum of 20′ of the screen

4. Seat yourself where you can observe both the telecast and your students' reactions.

This diagram shows the suggested placement of the television set: